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Karyomorphological Studies in *Girardinia diversifolia* (Link) Friss. (Urticaceae) Collected from Nepal

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Karyomorphological studies of *Girardinia diversifolia* (Link) Friss. (Urticaceae) were carried out on 33 individuals collected from Kathmandu and Dolkha District, Nepal. The chromatin pattern of resting nuclei shows simple chromocenter type. The somatic chromosome number was 2n=20 in all plants investigated. The chromosome complements of all plants showed bimordal karyotype, two large and 18 small chromosomes. No karyomorphological difference was found between two ecological types reported by Singh and Shrestha (1988).

Girardinia diversifolia (Link) Friss. (Urticaceae), commonly known as Himalayan nettle, is an indigenous fiber yielding plant of Nepal. The nettle fiber has been used in hills for domestic purposes for a long time. This species is widely distributed in the sub-tropical and temperate Himalayas. It is known to occur in India from Kashmir to Sikkim up to 2100 m and extending to the Khasia Hills in the eastern part and from Marwar, central India, to Travancore in the south (Hooker 1885). *Girardinia diversifolia* is also distributed in Nepal, Bhutan, Burma, Malaysia, Java, and Sri Lanka. Singh and Shrestha (1988) reported two ecological types of *G. diversifolia* on the bases of morphological features, seed and seedling characteristics and amino acid contents. However, no cytological study has been reported. This paper deals with the karyomorphology of *G. diversifolia*, and compare the cytological characters between the two ecotypes.

Materials and Methods

Materials used in this study were collected from Kathmandu and Dolkha District, Nepal (Table 1). Somatic chromosomes were observed in the meristematic cells of root tips or shoot apices. Root tips were pretreated in 0.002M 8-hydroxyquinoline for 3 hrs at 10–15°C and fixed in a mixture of ethyl alcohol and glacial acetic acid (3:1). Shoot apices were fixed in ethyl alcohol, chloroform and glacial acetic acid (6:3:1) mixture. For long time preservation, they were stored in 70% ethyl alcohol at 4°C. Materials were then washed with 45% acetic acid, and stained with a mixture of 2% aceto-orcein and 1N HCl (9:1) for 3 hrs. Squashes were made in 45% acetic acid. Types of resting and mitotic prophase were designated according to Tanaka (1971, 1977) and grouping of chromosomes by position of centromeres followed by Levan et al. (1964). Voucher specimens of chromosomal observations were deposited at the National Herbarium, Kathmandu (NHK).

Table 1. Localities and voucher specimens of *Girardinia diversifolia* investigated

Locality	Voucher specimen
Machchhegaon, Kathmandu, Nepal (1800 m alt.)	R. Shrestha 56384(1) – 56384(9)
Jiri, Dolkha, Nepal (2200 m alt.)	R. Shrestha 56385(1) – 56385(8)
Mude, Dolkha, Nepal (1500 m alt.)	R. Shrestha 56386(1) – 56386(3)
Charikot, Dolkha, Nepal (2500 m alt.)	R. Shrestha 56387(1) – 56387(6)
Bhedetar, Dolkha, Nepal (1400 m alt.)	R. Shrestha 56388(1) – 56388(7)

Results and Discussion

The chromatin pattern of resting nuclei was observed to contain small granular spherules of lightly stained chromatin (Fig. 1A). This pattern is comparable to the simple chromocenter type. At mitotic prophase, the early condensed segments were confined the proximal regions of both arms, showing the characteristics of the proximal type (Fig. 1B).

The chromosome numbers were determined in 33 individuals as 2n=20 (Figs. 1-C, D). The chromosome number of this species was determined for the first time in this study. The chromosome complements of all plants showed bimordal karyotype, two large metacentric and 18 small chromosomes. Two large chromosomes were varied in length between 2.1–2.0 μm and 18 small chromosomes 1.5–1.0

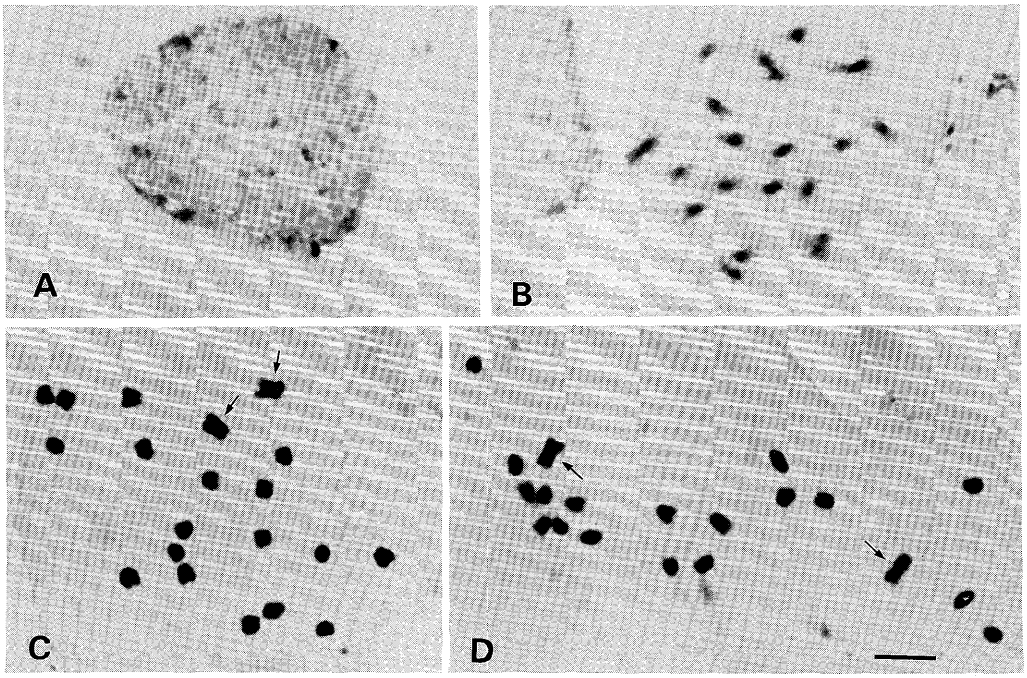

Fig. 1. Photomicrographs of chromosomes of *Girardinia diversifolia*. A: resting stage, B: mitotic prophase, C: mitotic metaphase collected from Jiri, D: mitotic metaphase collected from Machchhegaon. Arrows indicate large chromosomes. Bar represents 4 μm.

μm.

Sharma (1961) reported n=10 in *Girardinia heterophylla* collected from northwest Himalayas. He observed regular meiotic pairing at diakinesis in pollen mother cells. The chromosome number of *G. zeylanica* were reported 2n=20 by Gajapathy (1961). Bir and Chatha (1985) and Chatha and Bir (1987) observed n=12+0-2B in *G. leschenaultii.* These reports show that there are two kinds of basic number in the genus *Girardinia.* In this study, we observed 2n=20 in *G. diversifolia* and no B-chromosome. Singh and Shrestha (1988) recognized two types in this species collected from two different localities in Nepal (Machchhegaon and Jiri) by the differences of the habitat and morphological characters. Although we observed the chromosomes of the same individuals on which Singh and Shrestha (1988) studied, there was no karyomorphological differences between these two types.

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R. シュレスタ[a]，星野卓二[b]：ネパール産**Girardinia diversifolia (Link) Friss.**（イラクサ科）の核形態学的研究

ヒマラヤの亜熱帯から温帯地域に広く分布する*Girardinia diversifolia*の核形態学的研究を行った．ネパールのKathmanduおよびDolkha地方の5地点より採集した33個体について調べた結果，静止期染色体の核型は単純染色中央粒型であった．また，染色体数はすべて2n=20であった．核型は大型の染色体が2本，小型の染色体が18本，すべての細胞で観察され2様相的であった．また，Singh and Shrestha（1988）により識別された2つの生態型の間では核型に違いが認められなかった．

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